NATIONAL PROJECT FOR THE EVALUATION OF ERTS IMAGERY APPLICATIONS TO VARIOUS EARTH RESOURCES PROBLEMS OF TURKEY

(PROJECT NUMBER 28320)

THIRD PROGRESS REPORT
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PRINCIPLE INVESTIGATOR

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GENERAL BACKGROUND

The first progress report prepared in this context was submitted on April 7,1976 the second report being presented about three months later, that is on July 14, 1976. In the period between the presentation of the first and the secon progress reports, the investigators and the working groups did not receive any additional photographs, as the color and false color images expected to arrive within the framework of the present project were not availeble. Instead B/W photographs enlarged to 1/500.000 scale were distributed to the individual investigators ant the groups.

As mentioned in the second progress report, the findings and the results obtained during the activities conducted in the offices in the period between the preparation of the previous progress reports, by a total of eight working groups consisting of five participants of differing fields of interest, from eight institutions, foundations etc., were checked in the field by ground truth surveys, hence bringing an entirely new dimension and scope to the project At the present time, a total of fifteen teams are engaged in ground truth surveys in the field and the information and data provided by these teams are being evaluated, the main emphasis being placed on the determination of the prevailing vegetation cover and pattern; regarding the terminology to be adopted for the lithological units, efforts are concentrated on the activities aimed to find definite terms for the untermed and/or temporarily termed units on the maps prepared in this period.

Activities carried out within the framework of the present project period, were unfortunately limited to the larger scale B/W photographs as the color composite images referred above, were not available; in cases of problematic debatable areas, enlarged images (1/250.000) were used.

Equipment List

-Pocket Steoroscope
-Mirror Steoroscope
-Aero-Sketch Master
-Double Reflecting Projector
-Additive Color Viewer
-Multispectral Camera
-Zoom Transfer Scope
-Light Tables
-Magnifiers

Existing Documents

A- Landsat Images:
   M Bulk B/W 70 mm (-) Transparent
   S Bulk B/W 70 mm (+) Transparent
   T Bulk B/W 9,5" (+) Transparent
   P Bulk B/W 9,5" Paper Print

B- Geologic and Nydrogeologic Maps and Reports
C- Drill hole Loggs
D- Geophysical Survey Reports

2832 - B Elâzığ Area

General

The purpose and the scope of the present project as well as the equipment used and the list of personnel participating in the activities, area described in the second technical progress report and in the "General Background" section of the present paper.

The area described here is covered by geological, hydrogeological and agricultural surveys.

Geology

In addition to the examination of false color images of the black-and-white images, through a viewer, enlarged images (1/500.000 scale) were studied in detail, and ground truth surveys were conducted in the field to define the spectral determined. During these examinations and surveys, even the smallest detail observed on the images was taken into account in the determination of the boundaries of the formations, the terminology to be adopted for these formations being decided to be taken up following the completion of the ground truth surveys.

Igneous rocks show various shades of light gray. In the SE part of the image, i.e. the part characterized by partly cultivated land, the drainage system is comparatively uniform, areas intersected by deep valleys being totally absent.

To the E and NE parts of Lake Hazer, the color becomes darker and the drainage system is represented by a dense network.

Sedimentary Rocks: The NW part of the image is identified as a sedimentary mass on the basis of its color and the drainage system observed. The area described here is considered to be a limestone-bearing series, as various structures which might have been formed due to dissolution were observed.

Tectonics and Hydrogeology

Evaluation of linear features found within the project area, during the first report period, were continued and the NE-SW trending fault line extending through the SE part of Lake Hazer, is concluded to be the major fault line in the present area, where other fault lines, equally important were also observed.

In addition to the major and minor fault lines observed in the present area, a number of fracture and fissure systems, trending NW-SE were found on the limestone and marble blocks occuring here. With the purpose to determine the possible relationship between the water seepage problem encountered in the Keban Dam area and the fault lines briefly described above, a study was taken up to show the interrelationship between the recently formed sources and the faults, fractures and the lake waters in the lake area.

Agriculture

Activities and field surveys, as mentioned already in the previous progress report, are continued.

General

The purpose and the scope of the present project, as well as the equipment used and available documents and the list of personnel contributing to the project activities are described in the previous progress reports and in the "General Background" section of the present paper.

The area described here is covered by geological and forestry surveys.

Geology

With the purpose of making sound and reliable observations regarding the geologic and lithologic data provided by these images, the determination of whether or not the color changes observed, indicate the geological formations becomes highly important, particularly in areas characterized by thick vegetation cover and abundant types, as this one.

As mentioned already in the previous reports, the North Anatolian Fault line can be seen very distinctly on the images magnified to 1/500.000 scale. And studies so far carried out has shown that Alpine-type formations are not present in this area which is characterized by discontinuous structures and which is in fact described as an"intensively fractured rigid mass".

The most conspicious fracture system observed in the present area, is represented by shear fractures extending parallel to the roughly N 70 W trending North Anatolian Fault. Fractures described here are comparatively more conspicious in the rigid granitic massifs and Upper Cretaceous volcanics. The N-S trending fracture system, on the other hand, is probably represented by the left-lateral shear fractures, not as conspicious as the N 70 W trending features, developed at acute angles to the right-lateral North Anatolian Fault. NE-SW trending fractures observed in the present area, can be interpreted as the compression faults developed at right angles to the stresses producing deformation.

Forestry

Studies conducted regarding forests did not prove encouraging as the images are clouded and the color composites did not arrive; data and information duly obtained from such studies, furthermore, when compared with the available ones, showed substantial disparity. Although color composites are prerequisite in such surveys, intensive efforts were made to distinquish

a) The areas characterized by seasonal or annual vegetation cover represented by thick bushes, woods or forests, and

b) The types of forests, i.e. coniferous and deciduous with the aid of images obtained in winter. As the spring images will show relatively sharper contrasts regarding the broadleaf tree types, the subclassification of this type of forest shall be possible. Images obtained in summers, on the other hand, are expected to provide detailed information and data; due changes of color taking place at certain times of the year shall be best reflected in autumn images.

General

The purpose and the scope of the project, as well as the available and employed documents and equipment ant the list of personnel contributing to the project activities are described in the previous progress reports and the "General Background" Section of the present paper.

The area described here is covered by hydrogeology, oil and agriculture surveys.

Hydrogeology

Results obtained from the hydrogeology surveys are verified using the field data and with this purpose the following activities, already mentioned in the previous reports were conducted to check the reliability of below listed findings in the field:

-Contacts, faults and sources determined with the use of LANDSAT images

-Recent findings, previously unknown,
-Productivity of wells located on the extension of a single-fracture line or at the intersection of two fracture lines

Agriculture

Activities/were carried out on the black-and-white images, since the color images expected within the framework of the present project, did not arrive, and the results obtained are considered unsatisfactory. Field work is continued.

Petroleum

Emphasis is given to the determination of the general tect trends using the photomosaics. Research and exploration fo oil, is at present, limited to the regional scale, thus the lithological analyses being unsuccessful.

PROBLEMS AND RECOMMENDATIONS

During the evaluation of the black and white images available basic optic instruments are used and this, although not a major problem in activities aimed to the geological and tectonic aspects of the project, becomes highly important in forestry surveys, as the boundaries of the formations and the vegetation cover cam only be distinguished with the aid of color images; such factors also affected the success of the analyses carried out on the lithological units. The color images, therefore, used to overcome such difficulties, should be provided as it is stipulated in the project agreement, as soon as possible